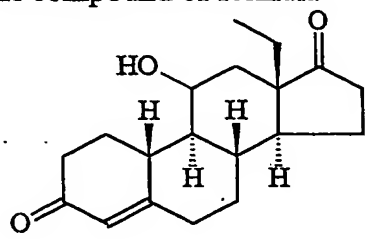
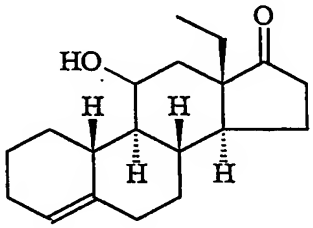
CLAIMS

1) A process for the preparation of Desogestrel which comprises the regioselective reduction of the compound of formula



XIIa

to give the compound of formula



XIVa

2) A process according to claim 1 in which said reduction is performed in the presence of an alkaline borohydride, a strong organic acid and a C_1-C_3 organic acid.

3) A process according to claim 2 in which said borohydride is sodium borohydride, said strong organic acid is trifluoroacetic acid and said C_1-C_3 organic acid is acetic acid.

4) A process according to claim 2 in which said reduction is performed in an organic solvent selected among dichloromethane, tetrahydrofuran or diglyme, preferably dichloromethane.

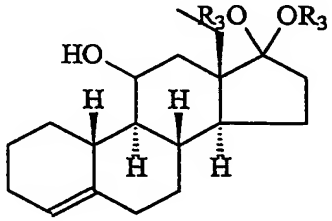
5) A process according to claim 2 in which the ratio between the moles of borohydride and the moles of compound XIIa is between 8 and 2, preferably between 5.5 and 6.5.

6) A process according to claim 3 in which trifluoroacetic acid and acetic acid are used in a ratio by volume from 2:1 to 1:2, preferably in a ratio by volume of 1:1.

7) A process according to claim 1 in which said reduction is performed with about 6 moles of sodium borohydride per mole of compound XIIa, trifluoroacetic acid and acetic acid in a ratio by volume of 1:1, in dichloromethane and at a temperature of reaction between 0°C and 25°C.

8) A process according to claim 1 which further comprises:

(b) the protection of the carbonyl group of the compound of formula XIVa to give the protected compound of formula

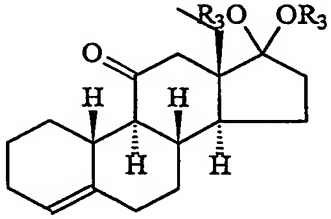


XV

in which

R_3 represents a C_1-C_5 alkyl group or the R_3 groups together represent a $-(CH_2)_n-$ chain wherein n is an integer from 2 to 4, optionally substituted by one or more methyl groups;

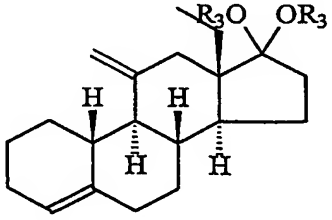
(c) the subsequent oxidation reaction of the protected compound of formula XV to give the compound of formula



XVI

in which R_3 has the above reported meanings;

(d) the subsequent olefination reaction of the compound of formula XVI to give the compound of formula



XVII

in which R_3 has the above reported meanings.

9) A process according to claim 8 in which the two R_3 groups together form a $-(CH_2)_n-$ chain wherein n is equal to 3.

10) A process according to claim 8 in which the protection of the carbonyl group (b) is performed in the presence of 4-7 equivalents of 1,3-propandiol, of 2-4 moles

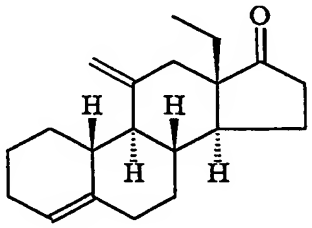
of triethylorthoformate per mole of substrate XIVa and of p-toluensulfonic acid in a catalytic amount, at a temperature between 10 and 50°C, preferably at about 40°C.

11) A process according to claim 8 in which the oxidation reaction (c) is performed with a chromium based oxidant selected among 10% chromic acid in 9/1 pyridine/water (Conforth's reagent), pyridinium chlorochromate and 4-dimethylaminopiridinium chlorochromate, in an organic solvent selected among dichloromethane or admixtures of dichloromethane and water, in the presence of a phase transfer, or pyridine, at a concentration of substrate XV between 0.05 and 0.2 molar and at a temperature between 0°C and 15°C.

12) A process according to claim 8 in which the olefination reaction (d) is performed by reaction with methyltriphenylphosphonium iodide or chloride, in a polar aprotic solvent or in an ether, in the presence of 1.1-1.5 moles of a strong base per mole of phosphonium salt, at a temperature between 40°C and 90°C.

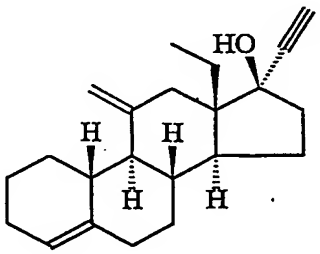
13) A process according to claim 8 which further comprises:

(e) the deprotection reaction of the compound of formula XVII to give the compound of formula



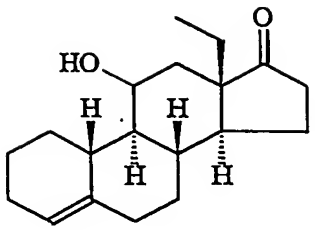
XVIII

(f) the subsequent ethinylation reaction at the 17 position of the compound of formula XVIII to give Desogestrel of formula



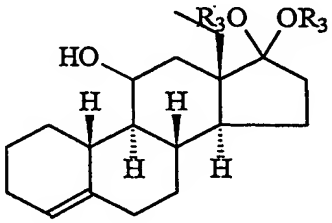
14) A process for the preparation of Desogestrel which comprises:

(b) the protection of the carbonyl group of the compound of formula



XIVa

to give the protected compound of formula

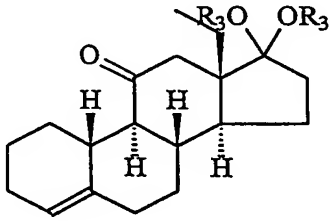


XV

in which

R_3 represents a C_1-C_5 alkyl or the two R_3 groups together represent a $-(CH_2)_n-$ chain wherein n is an integer from 2 to 4, optionally substituted by one or more methyl groups;

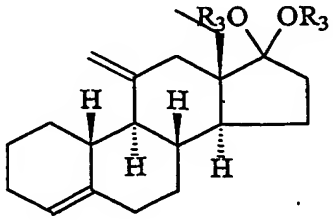
(c) the subsequent oxidation reaction of the protected compound of formula XV to give the compound of formula



XVI

in which R_3 has the above reported meanings;

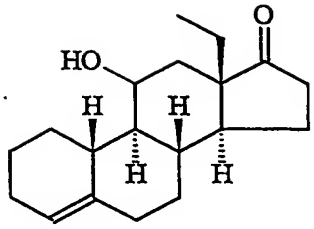
(d) the subsequent olefination reaction of the compound of formula XVI to give the compound of formula



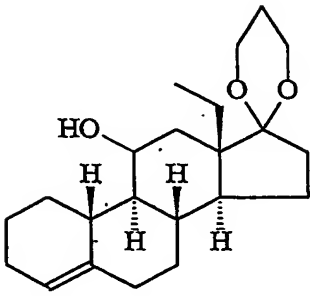
XVII

in which R_3 has the above reported meanings.

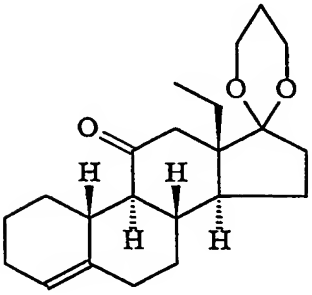
15) The compounds of formula



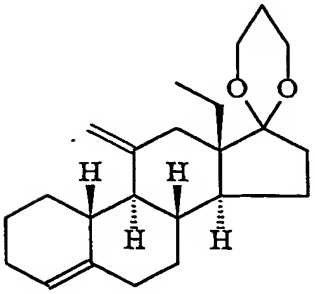
XIVa



XVa

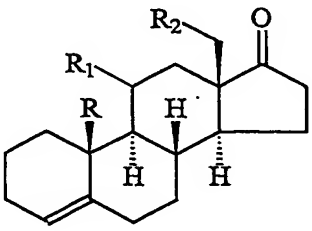


XVIa



XVIIa

16) A process for the preparation of a compound of formula



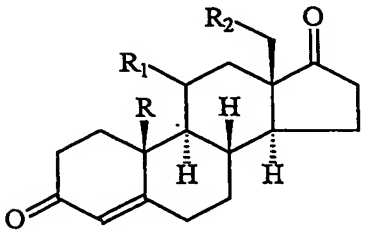
XIV

in which

R and R_2 represent H or CH_3, and

R_1 represents H or OH,

by regioselective reduction of the compound of formula



XII

in which R, R_1 and R_2 have the meanings reported above.

17) A process according to claim 16 in cui R=H, R_1=OH e R_2=CH_3.

18) A process according to claims 16 or 17 in which said reduction is performed according to claims 2 to 7.

19) Use of the compounds of formula XIIa, XIVa and XV as intermediates for the preparation of Desogestrel.